

Massachusetts Institute of Technology
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LUMINARY Memo #55

To: Distribution
From: C. Schulenberg
Date: 3 December 1968
Subject: LUMINARY Revision 61

Major Changes Incorporated into Revision 61

- 1) A program bug was fixed in R12. The call to PRIOCHNG in SETPOS2 which destroyed the return address was moved to POSGOOD prior to the call to SETPOS2.
- 2) The engine-fail routine (R40) was better restart-protected.
- 3) Alarm 105 (AOTMARK system in use) was changed to a POODOO with code 105.
- 4) V67 was modified so as to check the contents of WWPOS and WWVEL after the Proceed to the V06N99 display against the prior contents in order to decide whether or not to set the V67FLAG. This solved a problem that could arise if the loading of noun 99 was interrupted by a priority display.
- 5) A bug was corrected in the Trim Gimbal Control System. QDIFF and RDIFF were still being accessed as though they were single-precision quantities when in fact they had recently become double-precision.
- 6) The masking constant for V35 (Lamp Test) which determines which DSKY lights are to be illuminated was changed so as to light the correct lights for the landing radar.
- 7) The delay in R12 between the time the velocity read is initiated and the time the CDU and PIPA readings are stored was changed from 240 ms to 170 ms in order to conform to the GSOP.
- 8) Coding was added to Fresh Start to leave the Gimbal Lock and NO ATT lights on. This prevents movement of the IMU gimbals if a Fresh Start occurs while the IMU is in Coarse Align and Gimbal Lock.
- 9) The initialization of the DVMON (R40) parameters was moved to the beginning of each of the burn programs in order to make it possible to override these parameters prior to a burn if the numbers loaded are ever found to be improper. Formerly the parameters were loaded at IGNITION.

- 10) A bug was fixed in the coding connected with PCR 609 (Preferred IMU Orientation when thrust is along the Local Vertical).
- 11) PCR 622 was implemented (correction to V83's RDOT and THETA on Lunar Surface).
- 12) PCR 627.2 was implemented. (Fix N81 Data Load problem in P34/74, P35/75).
- 13) Coding was added to R04 and R77 to turn on the operator error lamp if R29 is running or if R04 is selected while R77 is running and vice versa.
- 14) PCR 618 was implemented (Non-Linear Hand Controller).
- 15) R12 was modified to use the authorized DSKY lights (3 and 5) instead of 1 and 2.
- 16) The R12 LR Repositioning logic was recoded to conform to the GSOP specification. This necessitated the old pad-load RPCRTANG to be replaced by the new pad-load RPCRTQSW.
- 17) The check on SNUFFBIT in the DAP was reworked. The old coding forced usage of the Trim Gimbal control law to depend upon the size of the offset acceleration even in the docked configuration.
- 18) The DAP was modified to load CDUX into CDUXD whenever X-axis override is allowed. This insures that FINDCDUW's computational coordinate frame will more closely reflect the actual spacecraft attitude.
- 19) PCR 630 was implemented (Update of Ascent Guidance Engine Parameters).
- 20) The two flagbits HONBIT and VONBIT were deleted since they were no longer needed by R12.
- 21) PCR 631 was implemented (reduce LGC executive and central processor load).
- 22) Sundance anomaly Y72 was fixed by resetting LOSCMFLG before the call to the designation logic by V41.
- 23) PCR 623 was implemented (use same noun numbers for P32 and P33 in LUMINARY and COLOSSUS II).
- 24) Coding was added to the Ascent Guidance Equations to perform a STOPRATE if FINDCDUW is bypassed due to lack of sufficient engine thrust.
- 25) Program bugs were fixed in the option 0 and the option 1 logic of P57. Calls to CDUTRIG were not being made prior to calls to CALCSMSC.

- 26) PCR 233 was implemented (change to CDH time test).
- 27) Sundance anomaly Y74 was fixed by making P34 and P74 initialize CENTANG to 130 degrees.
- 28) PCR 254.2 was implemented (modification to CDH time computation logic).